LAB #:

Water Quality Report

PESTICIDE

WSE 50

Commonwealth of Virginia
Department of Health
Division of Water Programs
Bureau of Water Supply Engineering

NAME OF WATER SYSTEM: FORT PICKETT
SOURCE: NOTTOWAY RIVER
OTHER INFORMATION: DEH WATER TREATMENT PLANT
FORT PICKETT
BLACKSTONE, VIRGINIA 23824-5000

REPORT RESULTS TO HEALTH OFFICIAL AT:
Name: VDH, DIV. OF WATER PROGRAMS
Address: 5700 THURSTON AVE.
City: DANVILLE, VA. Zip Code: 23455

REGION: ☐ Abingdon ☐ Culpeper ☒ Danville ☐ Lexington ☐ Richmond ☐ Virginia Beach ☐ Local Health Dept. ☐

PLANNING DISTRICT #: PIEDMONT
COUNTY: NOTTOWAY
INDEPENDENT CITY: FORT PICKETT
SAMPLING LOCATION: RS Ø1
CODE: 7-9 PF ØØ1.Ø

SOURCE TYPE: ☒ Public-Community ☐ Public-Noncommun

FIELD TESTS: Temp: pH: 6.9 Cl_2: Ø.Ø mg/L CO_2 mg
Alk: mg/L Hard.: mg

P.W.S.I.D. #: 5 1 3 5 2 5 0
TRANSACTION CODE: Ø 3

DATE COLLECTED: Mo 09 Day 24 Yr 91

TIME: 0900

COLLECTED BY: Truvelle

CONTAINER TYPE:
☒ Glass
☐ Plastic

PRESERVATIVE USED:
☐ None
☒ Ice
☐ Other
☐ Nitric Acid

SAMPLE TYPE:
D ☐ Reg. Inst.
P ☐ Plant Tap
R ☒ Raw Water
C ☐ Check
M ☐ MCL Check
S ☐ Other

DATE REC: 09/25/91
DATE REP: 11/22/91

CONT. I.D.	CONTAMINANT NAME (Maximum Allowable Level)		MTD.	S	ANALYSIS RESULTS	PRECISION	ANALYSIS DATE Mo	Day	Yr	A
2005	Endrin	0.0002	201	<	ØØØ.00002	± .0001	10	29	91	RL
2010	Lindane	0.004	201	<	ØØØØ.0001	± .0001	10	29	91	RL
2015	Methoxychlor	0.1	201	<	ØØØØ.002	± .002	10	29	91	RL
2020	Toxaphene	0.005	201	<	ØØØØ.002	± .002	10	29	91	RL
2105	2,4-D	0.1	206	<	ØØØØ.010	± .010	10	24	91	RL
2110	2,4,5-TP (Silvex)	0.01	206	<	ØØØØ.002	± .002	10	27	91	RL

LAB I.D. 0 0 4 1 5

PREPARED BY: [signature]

The results on this report are expressed in mg/L unless otherwise indicated. *A = analyst's initial

REFERENCE 21

well as local school groups, visit the installation to study the natural areas.

Open areas of the base are seeded with Kentucky 31 fescue and lespedeza to provide ground cover. Many of the herbaceous plants listed in App. A, Table A-2, grow naturally on these areas.

The use of chemicals to control weeds is minimal; however, a much greater use of herbicides is planned in the future on railroad rights-of-way, security fences, utility poles, and other areas difficult to mow. Herbicides used will include pramitol, diuron, and Round-Up®.

Wildlife

Common mammal and bird species which occur on FTP are listed in App. A, Table A-3. Of the wildlife species under management, rabbit and turkey populations have been declining since the 1960s when expansion of ranges and training areas was initiated. The reduction in turkeys can be attributed to the loss of suitable habitat, but the decline in rabbit populations is not understood. Research is being conducted to determine the cause. The increase in open habitat has favored quail reproduction.

The deer population ranges from 1,500 to 2,000 animals. In 1980, approximately 500 to 1,000 deer reportedly died of epizoologic hemorrhagic disease. Overcrowding in the controlled access area where hunting is not permitted was reported to be a factor in the deaths.

In addition to the wildlife species listed in the appendix, snakes (including copperheads), lizards, salamanders, turtles, and frogs also occur onbase.

Aquatic Species

Approximately 222 ha of freshwater lakes and ponds exist on FTP, of which 11 lakes and ponds, totaling 210 ha in area and ranging in size from 0.4 ha to 156 ha, are managed for game fish. Weeds are controlled chemically in some ponds, diquat being the only herbicide used.

REFERENCE 22

AFZA-FP-E

11 December 1990

MEMORANDUM FOR RECORD:

SUBJECT: Underground Storage Tanks

Recent UST actions are summarized below:

6 Dec 90 -	Removed three 12,000-gallon tanks at station 1558 and hauled to recycling center
7 Dec 90 -	Removed three 12,000-gallon tanks at station 766 and hauled to recycling center
10 Dec 90 -	Called Meade Anderson, SWCB, PRO and advised that soil at station 1558 appeared to be contaminated by POL (based on visual observations). I also told Mr. Anderson that soil would be sampled on 11 Dec 90 and we would report results as soon as available.
11 Dec 90 -	Removed one 12,000 tank at station 1400 behind Officer's Club. Another 12,000 gallon tank was removed at this station approximately one year ago. The previously removed tank was empty.
11 Dec 90 -	Soil sampling at stations 1558, 766 and 1400 was accomplished by Belpar.

DAVID L. FOLEY
Environmental Coordinator

ORIGINAL (Red)

AFZA-FP-E

20 December 1990

MEMORANDUM FOR RECORD:

SUBJECT: Underground Storage Tanks

Recent UST actions are summarized below:

13 Dec 90 - Received results of TPH tests for soil samples collected at stations 1558, 766, and 1400. Results for station 1558 greatly exceed the action level of 100 ppm TPH.

13 Dec 90 - Reported removal of USTs and results of TPH tests to Meade Anderson, Piedmont Regional Office, State Water Control Board (telephone report)

14 Dec 90 - Discussed cleanup procedure for station 1558 with Mr. Anderson, PRO, SWCB and I advised him that we planned to accomplish site characterization survey before continuing to excavate. Also, we discussed one bad sample at station 766.

14 Dec 90 - Filled tank pit at station 1400.

17 Dec 90 - Sent follow-up soil sample for station 766 to Environmental Labs for analysis. Sample was collected on 14 Dec 90 from same spot that bad sample was collected on 11 Dec 90.

18 Dec 90 - Submitted Purchase Request to Linda Julian for soil borings in and around excavated pit at station 1558. Estimated cost is $2200. Testing of soil at various depths and locations should show the extent of contamination. Expected time frame for accomplishment of boring and additional testing is the latter part of Jan 1991.

19 Dec 90 - Received result of TPH test for follow-up soil sample at station 766. Result was less than 50 ppm.

20 Dec 90 - Notified Bob Baird, SWCB, PRO of result received on 19 Dec 90 for follow-up soil sample at station 766. Mr. Baird advised that we could fill the pit at station 766.

DAVID L. FOLEY
Environmental Coordinator

REFERENCE 23

2.4 EXTENT OF CONTAMINATION

2.4.1 DETECTION

Detection of a release was first identified by soil samples taken from the bottom of the tank excavation and samples taken from the stockpiled soil. Detection in the pit ranged from 2360 ppm to 35 ppm for TPH. The stockpiled soil tested at 1390 ppm for TPH. These results and map can be found in Appendix H. The tanks were extracted from this location (1558) around December 10, 1990.

On or about January 4, 1991, Belpar performed two soil borings to further investigate the possibility of soil contamination from the USTs. One sample was taken from the open excavation at a depth of 16.5' and resulted in a TPH reading of 486 ppm. Soil boring #1 showed levels ranging from Not Detectable (ND) at the 25' level to 1010 ppm at the 10' level. The results of this investigation are in Appendix I of this report.

2.4.2 IMPACT ZONES

The vapor phase is graphically depicted in Drawing G-3597-5 (Appendix C). The vapor level readings can be found in the Drilling Logs included in Appendix D. Vapor readings are most concentrated in SB-11, SB-1 and SB-8 at levels ranging from 210 ppm to 250 ppm. These levels are found at an approximate average

depth of 20 feet from grade. Less notable readings were found in SB-10 and SB-9 at a level of 75 ppm. The higher levels are found fairly proximate to the original tank pit at a level at or near the saturated zone. These vapor levels are most likely vapor that is trapped in the subsurface as a result of the original release. Since the vapor seems to be fairly isolated, then they should dissipate over time with no ill effects to any potential receptors since there are no basements or vaults near the site.

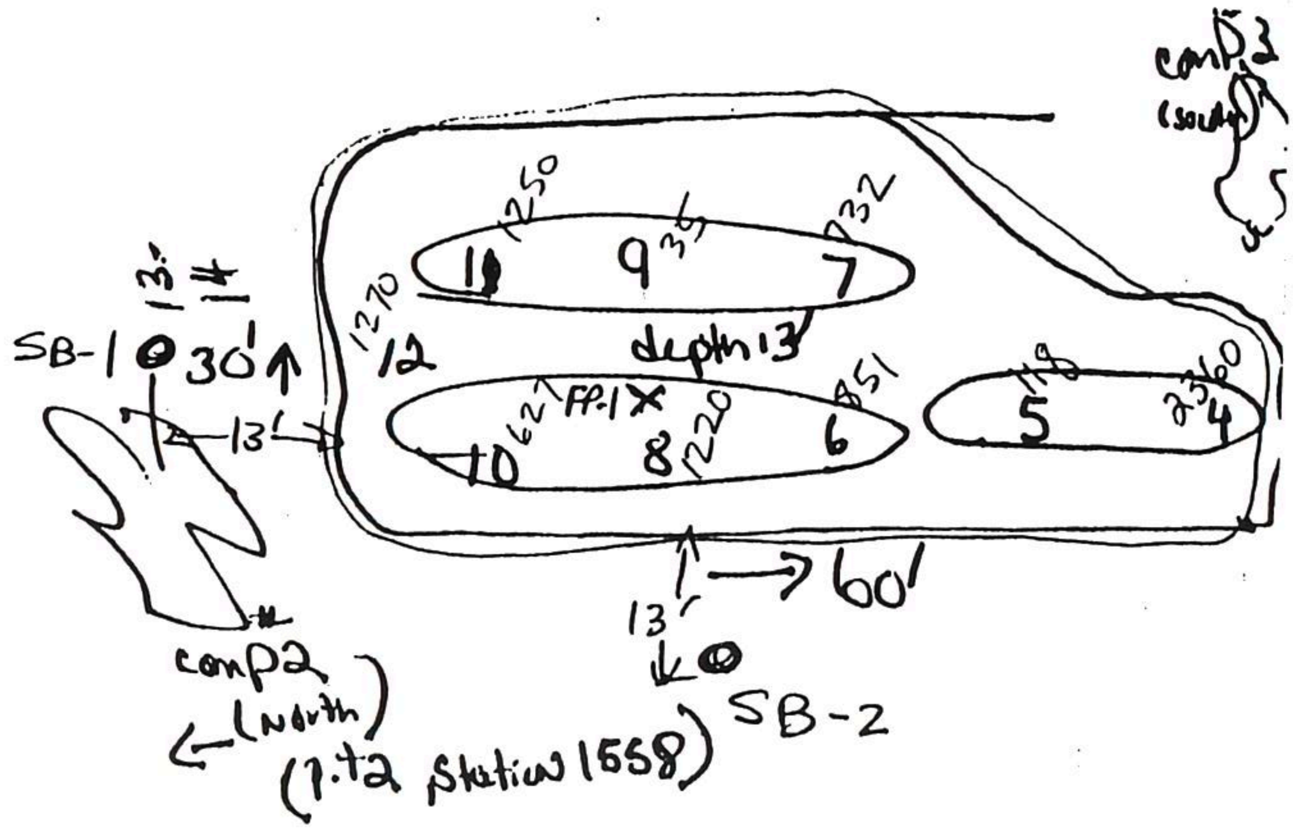
The residual phase is graphically depicted in Drawing G-3597-3 (Appendix C). As mentioned, previously selected samples that showed relatively high levels on the PID were sent to the laboratory for quantitive analysis. SB-11E and SB-1E were the only samples that showed detection (48 ppm). The laboratory analysis can be found in Appendix E. SB-1 was located within the excavation and SB-11 was located just south of the tank pit and cross gradient. These results illustrate that the residual levels are quite low. Since these levels are below the presumed SWCB action level of 100 ppm for TPH, then no action is contemplated for remediation at this time or in the future. This data illustrates that any residual contamination has been removed or has dissipated since the tanks were removed.

APPENDIX H

TANK REMOVAL MAP

AND

ANALYSIS


SB-1
30'
13'
13'
12
1270
1250
9
7
232
depth 13
FP-1 X
10
627
8
1220
6
851
5
4
2360
60'
13'
SB-2
comp2
(north)
(1-t2 station 1558)
comp3
(south)

BELPAR ENVIRONMENTAL
A CHEMFIQUEST Company

SPECIFICATION SHEET

Number _____
Date _____
By _____
Page ____ Of ____

**********ANALYSIS REPORT**********

JOB #: 1290-5023
SERVICES FOR: Belpar Environmental of VA, Inc.
DATE SUBMITTED: 12-12-90
DATE ANALYZED: 12-12-90
DATE COMPLETED: 12-13-90
METHOD OF ANALYSIS: AS NOTED BELOW
CUSTOMER JOB IDENTIFICATION: PT PICKETT
PROJECT #: H-2642-1
P.O. #: 91-C-051-MM

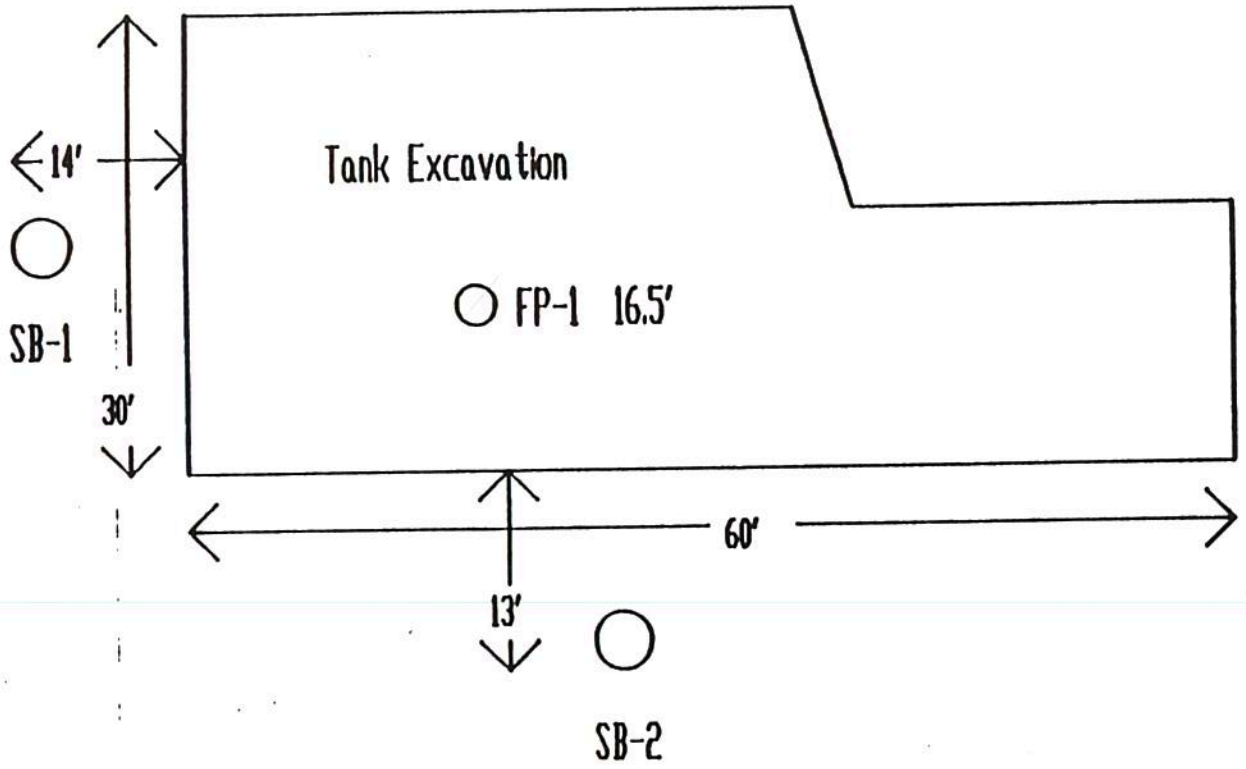
****

REIC SAMPLE #	BELPAR SAMPLE #	TPH ---mg/kg--	METHOD	MQL
5023-1	1	ND	418.1	20
5023-2	2	ND	418.1	20
5023-3	3	650	418.1	20
5023-4	4	2360	418.1	20
5023-5	5	118	418.1	20
5023-6	6	851	418.1	20
5023-7	7	732	418.1	20
5023-8	8	1220	418.1	20
5023-9	9	35	418.1	20
5023-10	10	627	418.1	20
5023-11	11	1250	418.1	20
5023-12	12	1270	418.1	20
5023-13	13	ND	418.1	20
5023-14	14	ND	418.1	20
5023-15	COMP # 1	ND	418.1	20
5023-16	COMP # 2	1390	418.1	20
5023-17	COMP # 3	2530	418.1	20
5023-18	COMP # 4	ND	418.1	20

MQL - Minimum Quantifying Level
ND - None Detected at MQL
TPH - Total Petroleum Hydrocarbons

APPENDIX I

SOIL BORING 1/10/91



BELPAR ENVIRONMENTAL, INC. 7500 Harvest Road Prince George, VA 23875 An Ameriquest Company	CLIENT: Fort Pickett	SITE: Station 1558
	PROJECT NO.: G-2825-1	APPROVED BY:
	DRAWING NO.: 2825-1	NO. / REVISION / DATE
	DRAWN BY: Barry L. Matthews	1 / 2
	DATE: January 11, 1990	3 / 4 / 5 / 6

BELPAR ENVIRONMENTAL
An [illegible] Company

SPECIFICATION SHEET

Number: _____
Date _____
By _____
Page ____ Of ____

**********ANALYSIS REPORT**********

JOB #: 0191-5261
SERVICES FOR: BELPAR ENVIRONMENTAL OF VA, INC.
DATE SUBMITTED: 1-4-91
DATE ANALYZED: 1-4-91
DATE COMPLETED: 1-7-91
METHOD OF ANALYSIS: AS NOTED BELOW
CUSTOMER JOB IDENTIFICATION: FT DICKETT
PROJECT #: G-2825-1
P.O. #: 91-D-136-GW

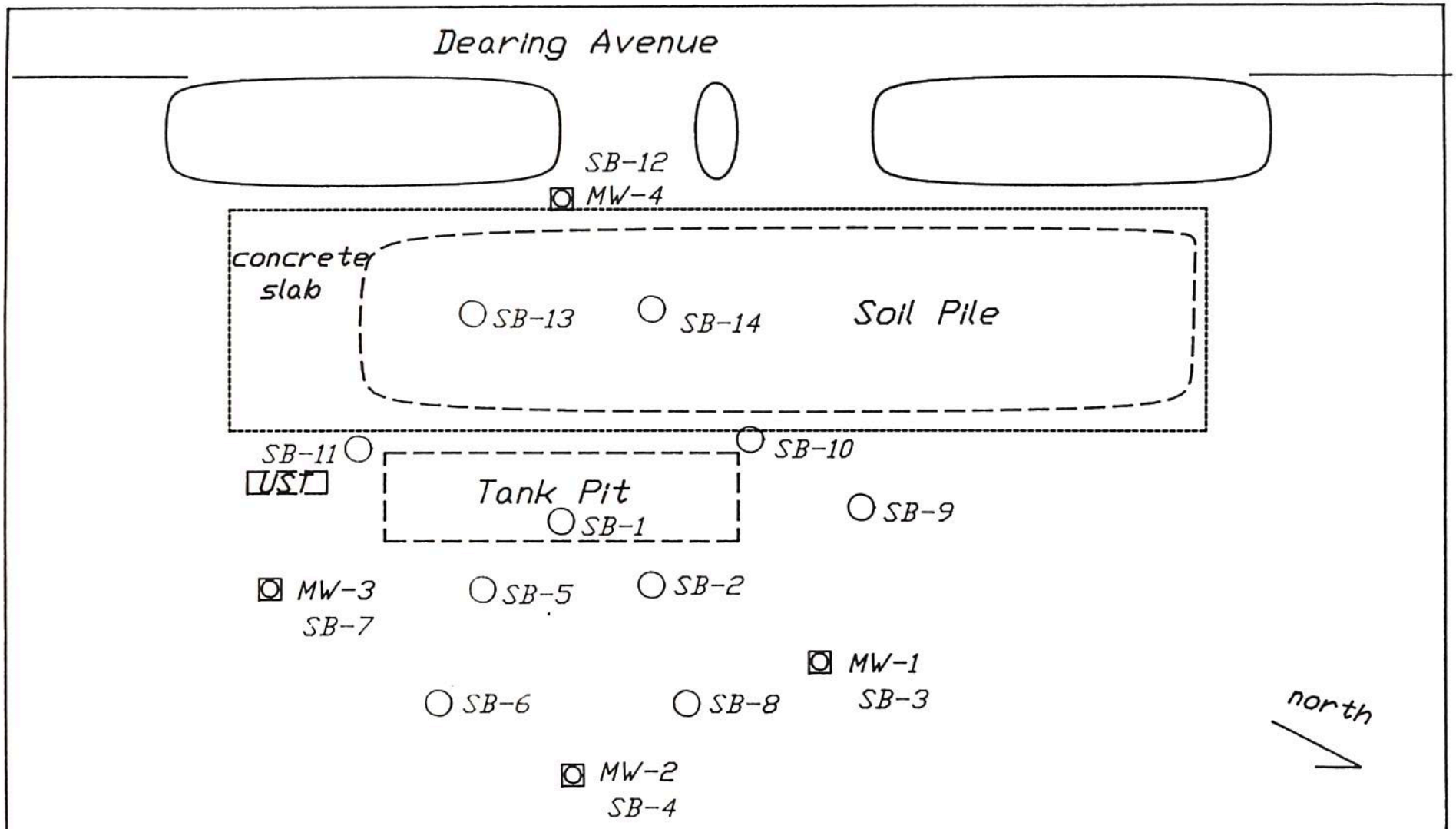
****

REIC SAMPLE #	Depth	BELPAR SAMPLE #	TPH ---mg/kg---	METHOD	MQL
5261-1		FP 1	485	418.1	20
5161-2	5'	SB 2A	ND	418.1	20
5161-3	10'	SB 2B	ND	418.1	20
5161-4	15'	SB 2C	ND	418.1	20
5161-5	20'	SB 2D	ND	418.1	20
5161-6	25'	SB 2E	ND	418.1	20
5161-7	5'	SB 1A	147	418.1	20
5161-8	10'	SB 1B	1010	418.1	20
5161-9	15'	SB 1C	101	418.1	20
5161-10	20'	SB 1D	79	418.1	20
5161-11	25'	SB 1E	ND	418.1	20

MQL - Minimum Quantifying Level
ND - None Detected at MQL
TPH - Total Petroleum Hydrocarbons

APPENDIX E

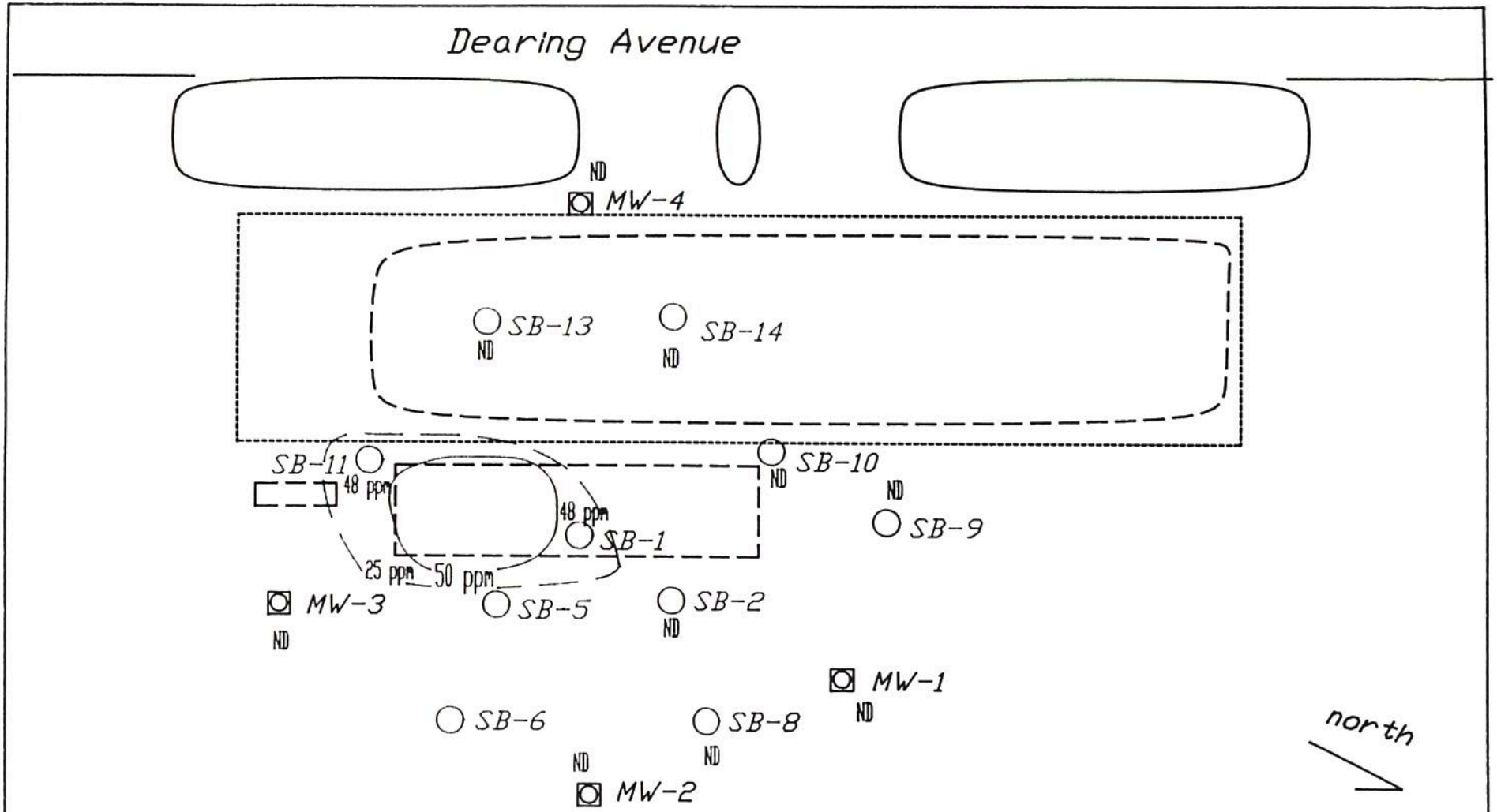
LABORATORY RESULTS



Site Map

scale : 1" = 40'

BELPAR ENVIRONMENTAL, INC. 7500 Harvest Road Prince George, VA 23875 An Ameriquest Company	CLIENT: URS	SITE: Fort Pickett
	PROJECT NO.: G-3597-1	DRAWN BY: Jason Flippo
	DRAWING NO.: G-3597-1	DATE: 8-7-91



Residual TPH at 25'

scale : 1" = 40'

BELPAR ENVIRONMENTAL, INC. 7500 Harvest Road Prince George, VA 23875 An Ameriquest Company	CLIENT: URS	SITE: Fort Pickett
	PROJECT NO.: G-3597-1	DRAWN BY: Jason Flippo
	DRAWING NO.: G-3597-4	DATE: 8-7-91

Quality Analytical Services

REIC Laboratory

Research, Environmental & Industrial Consultants, Inc.

Drawer G • Cool Ridge, West Virginia 25825 • 1-304-787-3700
1-800-999-0105
FAX 1-304-787-3252

ORIGINAL (Red)

**********ANALYSIS REPORT**********

JOB #: 0891-7945
SERVICES FOR: Belpar Environmental of Virginia, Inc.
DATE SUBMITTED: 8-1-91
DATE SAMPLED: 7-31-91
DATE ANALYZED: 8-1-91
DATE COMPLETED: 8-2-91
METHOD OF ANALYSIS: As Noted Below
CUSTOMER JOB IDENTIFICATION: Fort Pickett/URS
PROJECT #: G-3597-1
P. O. #: 91-J-145-GW

REIC SAMPLE #	BELPAR SAMPLE #	TPH ----mg/kg----	METHOD	MQL
7945-1	P 1	229	418.1	20
7945-2	P 2	601	418.1	20
7945-3	P 3	154	418.1	20
7945-4	P 4	78	418.1	20
7945-5	P 5	3370	418.1	20
7945-6	SB1E	48	418.1	20
7945-7	SB2B	ND	418.1	20
7945-8	SB3B	ND	418.1	20
7945-9	SB4D	ND	418.1	20
7945-10	SB5E	ND	418.1	20
7945-11	SB7B	ND	418.1	20
7945-12	SB8C	ND	418.1	20
7945-13	SB9C	ND	418.1	20
7945-14	SB10D	ND	418.1	20
7945-15	SB11E	48	418.1	20
7945-16	SB12E	ND	418.1	20

MQL - Minimum Quantifying Level
TPH - Total Petroleum Hydrocarbons
ND - None Detected at MQL

DATE 8-2-91 APPROVED Ray Erickson
Ray Erickson

REFERENCE 24

3.0 SAMPLING RESULTS

3.1 SOIL GAS

The measured FID concentrations of total organic vapors for each station are presented in Table 3-1. The only detectable measurements were obtained at the probes adjacent to the four corners of the pit, SG-4, SG-6, SG-13, SG-[illegible] and the probe midway along the northern edge of the pit, SG-[illegible]. The readings obtained were 100 and 68 ppm at the northwest, SG-4, and southeast, SG-6, corners, respectively. The remaining readings ranged from 1 to 26 ppm. The contaminant plume is likely to extend no farther than 10 feet from the pit boundaries, since no contaminants were detected at the most distant grid locations.

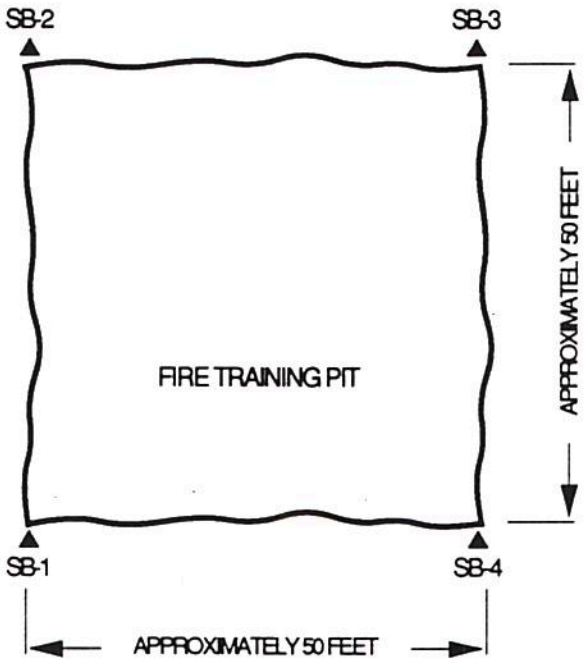
3.2 SOILS

Soil samples were analyzed for total metals, VOCs, and PAHs as listed in Table 2-1. The only analytes observed above detection limits were the following five metals [with concentration ranges, milligrams per kilogram (mg/kg)]:

1. Arsenic (below detection limit to 3.87),
2. Barium (10.5 to 22.9),
3. Cadmium (0.610 to 2.07),
4. Chromium (2.74 to 31.5), and
5. Lead (below detection limit to 8.58).

Table 3-2 presents the results of the chemical analyses of soil samples found to contain the above-listed contaminants. Appendix B contains the complete set of laboratory results for soil sample analyses.

D21/FT. PICKETT.1
290h



▲ SB-5

N

0 25 50

SCALE IN FEET

LEGEND

▲ SOIL BORING LOCATIONS

Figure 2-2
SOIL SAMPLING LOCATIONS

SOURCE: HUNTER/ESE, 1990.

FORT PICKETT
FIRE TRAINING AREA
BLACKSTONE, VIRGINIA

Table 3-2. Analyte Concentrations in Soil Samples

Boring	Sample	Depth (inches)	Analyte Concentration (mg/kg) Arsenic	Barium	Cadmium	Chromium	Lead
SB-1	PICKS*1	56-60	BDL	14.6	0.759	3.28	8.01
SB-1	PICKS*11 (duplicate)	56-60	BDL	14.0	0.610	2.74	6.35
SB-2	PICKS1*5	12-24	2.10	14.7	2.07	12.6	6.81
SB-3	PICKS1*7	48-60	1.38	10.5	0.645	5.87	BDL
SB-4	PICKS1*9	32-40	1.99	14.1	1.79	10.0	5.01
SB-5	PICKS1*3	12-24	3.87	22.9	2.34	31.5	8.58

Note: BDL = below detection limits.

Source: Hunter/ESE, 1990.

For a given metal, contaminant concentrations in the four samples from the pit corners were approximately of the same order of magnitude, but lower than the background levels observed in SB-5. This suggests that contaminants may have been successfully contained by the pit berms in the past.

Based on the results of the monitor well borings, the subsurface geology is relatively consistent across the site. The surficial stratum encountered during drilling consists of a weathered saprolitic formation with loose to dense silty sand ranging in color from pink to orange. Gradation to less weathered zones is gradual, generally ocurring within the first 10 to 15 ft as evidenced by occurrence of larger rock fragments.

3.3 GROUNDWATER

Water samples were analyzed for total metals, VOCs, and PHCs as listed in Table 2-1. The only analytes observed above detection limits were the following three metals [with concentration ranges, milligrams per liter (mg/L)]:

1. Barium (0.0811 to 0.152),
2. Chromium (0.0088 to 0.0126), and
3. Lead (0.0503 to 0.119).

Table 3-3 presents the results of the chemical analyses of groundwater samples found to contain the above-listed contaminants. Arsenic and cadmium found in the soil samples were not detected in the groundwater. Appendix B contains the complete set of laboratory results for groundwater sample analyses.

Concentrations of barium and chromium were approximately of the same order of magnitude in each well. Levels of lead in MW-2 and MW-3 were